HEALTH AND SAFETY PLAN

ASBESTOS ASSESSMENT
BUNKER HILL SUPERFUND SITE
KELLOGG, IDAHO

Prepared for:

CH2M HILL
777 108th Avenue, N.E.
Bellevue, Washington

by:

Converse Consultants Mountain Region
1190 West River Street
Boise, Idaho 83702

CCMR Project No. 94-63140-01

October 7, 1994

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KELLOGG, IDAHO

PROJECT PERSONNEL

		PHONE
Project Number:	94-63140-01	
Project Manager:	J. Tom Wise (Converse)	702-856-3833
Facility/Site Manager:	Trey Herbert (Pintlar)	208-784-1321
Site Safety Officer (SSO):	Ted Ice (Converse)	702-856-3833
Alternate SSO:	Tom Walter (Converse)	208-388-1111
Subcontractor Safety Representative:	Peggy Williamson (Bison)	509-624-4341
Client Contact:	Joan Stoupa (CH2M HILL)	206-453-5005
Plan Preparer:	Dale Walsh, CIH	702-739-8811
Preparation Date:	October 7, 1994	
Expiration Date:	April 7, 1995	

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APPROVALS

Corporate Health and Safety Officer/Plan Preparer:

Dale Walsh 10/8/94

Dale Walsh, CIH (DATE)

Site Safety Officer:

Ted Ice (DATE)

Project Manager:

J. Tom Wise (DATE)

This Health and Safety Plan is valid only for this specific project as described in Section 3.0. It is not to be used for other projects or subsequent phases of this project without the written approval of the Corporate Health and Safety Officer.

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1.0 HEALTH AND SAFETY PLAN SUMMARY

1.1 PURPOSE AND SCOPE OF PROJECT

The purpose of the asbestos survey at the Bunker Hill Industrial Complex is to document the extent and location of asbestos containing materials (ACMs). The complex includes the Lead Smelter area, the Phosphoric Acid/Fertilizer Plant area, and the Zinc Plant area on a 21 square mile site. The information obtained from the surveys will be used to assess the impact of demolition activities on potentially hazardous building materials.

This project will include the collection of approximately three thousand five hundred (3500) suspect asbestos-containing bulk samples. These samples will be submitted to appropriate laboratories for analysis. The CCMR Work Plan, provided under a separate cover, describes sampling procedures to be used during this project. These procedures are designed to minimize employee exposure to the hazardous materials being assessed.

1.2 PROJECT PERSONNEL RESPONSIBILITIES

	Name	Phone
PROJECT MANAGER:	Tom Wise	702-856-3833
SITE SAFETY OFFICER:	Ted Ice	702-856-3833
ALTERNATE SSO:	Tom Walter	208-388-1111
SUBCONTRACTOR SAFETY REPRESENTATIVE:	Peggy Williamson	509-624-4341
CORPORATE H&S OFFICER:	Dale Walsh, CIH	702-739-8811

Project Number: 94-63140-01

1.3 SITE HAZARDS

HAZARDOUS SUBSTANCES TO BE POTENTIALLY ENCOUNTERED:

Asbestos-containing building materials
Heavy metal (i.e., lead, cadmium, zinc, arsenic, and antimony) containing soils and dusts
Mercury contaminated surfaces (Zinc Plant areas-Ref. Attachment A)

HAZARDOUS CONSTITUENTS OF CONTAMINATED SUBSTANCES:

Hazardous Substance/Source	Max. Concen. Found at Site	Potential Health Hazards
Asbestos/Building Materials	Various TSI and Misc. ACM	Dyspnea, Interstitial Fibrosis, Restricted Pulmonary Function, Asbestosis, Lung Cancer, Mesothelioma
Lead/Contaminated Soils & Surfaces	860,000 ppm at Smelter Complex	Gastroenteritis, Weakness, Constipation, Abdominal Pain, Anemia, Gingival Lead Line, Abdominal Pain, Paralysis in Wrist/Ankles
Cadmium/Contaminated Soils & Surfaces	127,000 ppm at Smelter Complex	Suspected human carcinogen, skin absorbed, tracheobronchitis, pneumonitis, pulmonary edema, excessive salivation, a dry, burning throat, headache, aching muscles, coughing, chest tightness and pain, nausea, chills, fever, irreversible renal tubular damage
Arsenic/Contaminated Soils & Surfaces	160,000 ppm at Smelter Complex	Suspected human carcinogen (skin and lung), severe skin irritation with long contact duration, coughing, chest pain, and extreme general weakness, inflammation of the GI tract, loss of appetite, and violent vomiting if swallowed, hoarse voice, perforated nasal septum, conjunctivitis, skin lesions, peripheral numbness

Zinc/Contaminated Soils & Surfaces	754,000 ppm at Smelter Complex	Zinc has very low toxicity, and potential exposures to zinc in soils at the site are unlikely to be of toxicological concern.
Mercury/Contaminated Surfaces	Mercury Droplets at Zinc Plant Mist Precipitators	Excessive irritability (erethism), muscle tremors, loss of appetite and gingivitis, gastrointestinal problems and severe anuria (suppression of urine formation)
Antimony/Contaminated Soils & Surfaces	Not Available	Primary skin, eye, nose, and throat irritants, vomiting, bloody stools, slow shallow respiration, pulmonary congestion, dry throat, nausea, headache, sleeplessness, loss of appetite, and dizziness.

OTHER POTENTIALLY HAZARDOUS CONDITIONS:

- Chemicals Brought On-Site (e.g., surfactant, decon soaps, etc.)
- Slip, Trip, and Fall Hazards
- Cold Stress
- Lifting Hazards
- Confined Spaces (e.g., tunnels with pipe runs)
- Unstable building structures
- Vehicle Safety
- Tick Bites (i.e., Lyme Disease and Rocky Mountain Spotted Fever)
- Deer (or similar) Mouse and Related Droppings (i.e., Hantavirus)
- Poor Lighting
- Protruding Objects

1.4 CHEMICAL EXPOSURE MONITORING

Industrial Hygiene Monitoring for Metals and Asbestos:

Industrial hygiene sampling for lead, cadmium, zinc, arsenic and asbestos will be conducted using National Institute of Occupational Safety and Health (NIOSH) methods to characterize employee exposures to these materials while conducting survey activities.

Direct Reading Instrumentation:

An MEI Miniram aerosol monitor will be used for assessing airborne particulate contamination on a real-time basis. The action level (i.e., upgrade from Level

D to C) for each area will be based upon the following formula: one-half the PEL (mg/m^3) divided by maximum ppm or mg/kg of material of concern (i.e., lead, cadmium, arsenic, etc.) found in the area times 1,000,000. For example, if the maximum lead level was 860,000 ppm and the PEL was 0.05 mg/m^3 then the action level would be 0.029 mg/m^3. Additional guidance on the use of the Miniram is found in Section 6.0 and PPE requirements are found in Section 7.0 and in Attachment A.

Mercury Exposure:

If liquid mercury contamination is encountered (Refer to Attachment A for locations), the cartridges on the air purifying respirator will not be adequate to protect against mercury vapors. If a direct reading instrument (i.e., Jerome Mercury Vapor Analyzer) is not available, then Level B (i.e., supplied air respirator) will be necessary.

1.5 EXPLOSIVE ATMOSPHERE/CONFINED SPACE MONITORING

No explosive atmospheres are anticipated during this project. There is a possibility that confined spaces (i.e., pipe chases, basements, etc.) will have to be entered to assess asbestos materials. If this is the case the space will be assessed for appropriate oxygen content (i.e., > 19.5%) and potential presence of hazardous chemicals. If there is not enough natural ventilation in the space it shall not be entered until an assessment as to whether it is a "permit-required" confined space. If a question arises as to the space's safety, the CHSO should be contacted and consulted prior to entry.

1.6 PROTECTIVE EQUIPMENT AND PROCEDURES AND SITE CONTROL

Engineering Controls:

Engineering controls (e.g., wet methods, minimization of contact and disturbance, etc.) will be employed to prevent employee exposure to the hazardous materials that may be potentially encountered during this project.

Minimal Personal Protective Equipment (PPE) (Level D):

- Steel-toed boots with vinyl overboots,
- Safety eyewear,
- Work uniform (to be washed every day),
- Air Purifying Respirator with HEPA cartridge in a bag which is readily available to personnel.

PPE Required When Level C Designated:

- Half-mask air purifying respirator with HEPA cartridge, or Powered Air Purifying Respirator (PAPR) when encountering loose asbestos debris.
- Tyvek coverall when sampling in contaminated areas or overhead.
- Surgical gloves when sampling contaminated areas

Minimal Site Control:

Non-essential personnel and bystanders shall be kept at a safe distance or out of the room where potentially hazardous materials are being sampled. The Bunker Hill site is currently manned by security personnel to restrict access by unauthorized individuals.

1.7 DECONTAMINATION

Decontamination will be conducted at the decontamination trailer located at the Phosphorous Plant. Contaminated boots and gloves will be rinsed off prior to removal and all protective clothing will be removed in a manner to reduce dust generation. All clothing and PPE worn on site will remain on site until they are completely decontaminated at the end of the project. Uniforms will be laundered on site by the appropriate contractor on a daily basis. All personnel will shower prior to redressing in their street clothes.

1.8 EMERGENCY PROCEDURES

Hospital Location:

The closest Hospital to this project is the Shoshone Medical Center located at Jacobs Gulch in Kellogg, ID. The hospital route map can be found in Attachment C. Directions to the hospital are found in Section 11.0.

Emergency Phone Nos:

Hospital:	784-1221
Fire:	911
	784-1188 (Kellogg)
	752-1123 (Wallace)
Ambulance:	911
	784-1188
Police:	911
	753-3000
Client Contact:	206-453-5005 (Joan Stoupa)
Converse Contact:	702-856-3833 (Tom Wise)

Emergency Signals:

The Site Safety Officer will verbally instruct personnel either in person or on the radio to leave the site when conditions warrant or when instructed to do so by site personnel on the radio.

Meeting Location:

Personnel shall meet at the decontamination station in the Phosphoric Acid Plant area. Personnel will proceed upwind of any visible releases or fires or other hazardous conditions during an emergency. All personnel should be accounted for by the SSO to ensure that no personnel have been left behind.

1.9 RECORDKEEPING

HSP Compliance Agreement:

All CCMR personnel working on this project shall read, understand and sign the HSP Compliance Agreement located in Attachment B prior to beginning work. Other recordkeeping requirements are described in Section 13.0.

2.0 APPLICABILITY

The provisions of the plan are mandatory for all on-site CCMR employees engaged in hazardous material investigation activities associated with this project which may involve health and safety hazards. The CCMR Project Manager shall supply this Health and Safety Plan (HSP) to each site subcontractor, if applicable, to inform subcontractors of site hazards. The HSP may be used as a guidance document by properly trained and experienced CCMR subcontractors. However, CCMR claims no responsibility for the use of this HSP by others, and does not guarantee the health and safety of any person entering the site.

This HSP is written for the specific site conditions, purposes, dates, and personnel specified. However, changing and/or unanticipated site conditions may require modification of this site safety plan in order to maintain a safe and healthful work environment. Any proposed changes to this plan should be reviewed with the CCMR Corporate Health and Safety Officer, or his designee, prior to their implementation. If this is not feasible, the site/project manager may modify the plan and record all changes in the field log book; under no circumstances will modifications to this plan conflict with Federal, State, or local health and safety regulations.

3.0 FACILITY BACKGROUND/WORK PLAN

3.1 SITE HISTORY AND DESCRIPTION

The Bunker Hill Mine operated from 1895 until 1981 and then was reopened in 1988. The adjacent lead and zinc smelter complex operated from 1916 until 1981. The Bunker Hill Mine operation grew to a maximum milling capacity of 2,500 tons of ore per day and produced one-fifth of the refined lead, zinc, and silver in the U.S. It typically employed approximately 2,000 people. Facility activities stopped in 1981 from the combined effects of lower market prices and increased operations costs. The site consists of approximately 21 square miles.

There are three main areas of the site which consist of the Lead Smelter area, the Phosphoric Acid/Fertilizer Plant area, and the Zinc Plant area. The Lead Smelter area covers approximately 59 acres. Major operations in the area included blending and pelletizing of concentrates, sintering, smelting, and refining of lead and trace elements, and sulfuric acid production. The smelter has not operated since 1981, however, salvaging operations have continued periodically in this area since closure. Much of the major equipment has been removed along with some buildings, building materials, and material piles. The Lead Smelter is situated on a hillside that slopes gently to the north. A prominent feature in this area is the new smelter stack which was built in 1977 and towers several hundred feet above the rest of the area.

The Phosphoric Acid/Fertilizer Plant has been cleaned up and currently serves as a base of operations.

The Zinc Plant area covers approximately 60 acres. Major operations in the area included concentrate handling and pretreatment, roasting, leaching, electrolytic recovery of zinc, sulfuric acid manufacturing, and electrolytic cadmium recovery. The Zinc Plant has not operated since closure in 1981. Salvaging operations continued periodically in this area after closure, but were stopped in 1989 in response to an EPA administrative order. Much of the major equipment has been removed along with some material accumulations. The Zinc Plant is located slightly more than 1 mile south of the mouth of Government Gulch. The Zinc Plant facilities are located on the floor of the gulch as well as on the eastern hillside above the gulch floor. The Old Cottrell and new Zinc Plant stack are located in the northeast corner of this area on a hillside overlooking the Zinc Plant.

The Site Characterization Report for the site listed thirteen (13) contaminants of concern which include the following:

- Antimony
- Arsenic
- Beryllium
- Cadmium
- Cobalt
- Copper
- Lead
- Mercury
- Selenium
- Silver
- Zinc
- Asbestos
- PCBs

The main contaminants of concern are Lead, Cadmium, Arsenic, Mercury, Zinc and Asbestos. The maximum concentrations of the metals are described below.

Maximum Metal Soils Concentrations (mg/kg)

Areas	Arsenic	Cadmium	Lead	Zinc
Hillsides	300	245	14,400	16,100
Smelterville Flats	504	78	30,000	15,600
Central Impoundment Area	692	52	7,760	23,600
Page	202	39	4,350	4,260
Smelter Complex[a]	160,000	127,000	860,000	754,000
Mine Operations Area	44,300	3,630	651,000	170,000
Background	<10	1	43	95

Source: CH2M Hill Health and Safety Plan, 1994 (Gott and Cathrall, 1980)
[a]Includes Lead Smelter area, Magnet Gulch/Deadwood Gulch areas, Phosphoric Acid/Fertilizer Plant areas, and Zinc Plant area.

The mercury is found in areas around the Zinc Plant area such as the Carpenters Shop, Framing Shed, Acid Plant Area, Mercury PPT Building, and Mist Precipitator. The asbestos is found throughout the buildings at the site.

3.2 PURPOSE AND SCOPE OF WORK

The purpose of this plan, which was developed specifically for operations at the subject site, is to assign responsibilities, establish personal protection standards and mandatory safety procedures, and provide for contingencies that may arise while operations are being conducted at the site. This plan complies with, but does not replace, Federal Health and Safety Regulations as set forth in 29 CFR 1910 and 1926. This plan is to be used by Converse Consultants Mountain Region, Inc. (CCMR) personnel as a supplement to such rules, regulations, and guidance.

The objectives of the site characterization of the subject site are the following:

- Identify asbestos-containing building materials at the subject site,

To meet the objectives of this investigation, CCMR proposes a scope of work which includes the following on-site tasks:

- The collection of approximately three thousand five-hundred (3500) suspect asbestos-containing bulk samples.

4.0 RESPONSIBILITIES

Converse Consultants Mountain Region, Inc. (CCMR) will have site safety and health oversight and coordination responsibilities for CCMR personnel; each subcontractor will be held accountable for the safe and healthful performance of work by each of their employees, subcontractor, or support personnel who may enter the site.

The provisions of this health and safety plan along with the applicable regulations issued by governmental entities will be strictly adhered to by CCMR.

4.1 PROJECT MANAGER

The Project Manager (PM) shall direct on-site operations. The PM may delegate all or part of these duties to a properly qualified CCMR employee who is designated as the Site Manager. At the site the PM, assisted by the Site Safety Officer (SSO), has primary responsibility for:

1. Seeing that appropriate personal protective equipment and monitoring equipment is available and properly utilized by all on-site CCMR personnel;

2. Establishing that CCMR personnel are aware of the provisions of this plan, are instructed in the work practices necessary to ensure safety, and are familiar with planned procedures for dealing with emergencies;

3. Establishing that all CCMR on-site personnel have completed AHERA asbestos training for building inspection, and are medically cleared to wear a respirator and have been fit tested for the appropriate respirator(s);

4. Seeing that CCMR personnel are aware of the potential hazards associated with site operations;

5. Monitoring the safety performance of all CCMR personnel to see that the required work practices are employed;

6. Correcting any CCMR work practices or conditions that may result in injury or exposure to hazardous substances;

7. Preparing any accident/incident reports for CCMR activities (see Section 13.0);

8. Seeing to the completion of Plan Acceptance forms by CCMR personnel and subcontractor personnel, if applicable (See Attachments);

9. Halting site operations, if necessary, in the event of an emergency or to correct unsafe work practices; and

10. Reviewing and approving this project health and safety plan.

4.2 SITE SAFETY OFFICER

The Site Safety Officer's (SSO) duties may be carried out by the PM or other CCMR site manager. The SSO:

1. Implements project Health and Safety Plans, and reports any deviations from the anticipated conditions described in the plan to the PM, and, if necessary, the CHSO.

2. Checks with the OHSO or CHSO to see that assigned CCMR personnel have current Fit-For-Duty medical and training authorizations.

3. Assumes any other duties as directed by the PM or CHSO.

4. Identifies all personnel with special medical problems (e.g., allergies, perforated eardrum, etc.).

5. Provides ongoing review of the protection level needs as project work is performed, and informs the PM of the need to upgrade/downgrade protection levels as appropriate;

6. Halting site operations, if necessary, in the event of an emergency or to correct unsafe work practices; and

7. Reviews and approves this project health and safety plan.

4.3 CORPORATE HEALTH AND SAFETY OFFICER

The Corporate Health and Safety Officer (CHSO) shall:

1. Determine the need for periodic audits of the operation to evaluate compliance with this plan.

2. Provide health and safety support as requested by the SSO and PM.

4.4 PROJECT PERSONNEL

Project personnel involved in on-site investigations and operations are responsible for:

1. Taking all reasonable precautions to prevent injury to themselves and to their fellow employees; and

2. Performing only those tasks that they believe they can do safely, and immediately reporting any accidents and/or unsafe conditions to the SSO or PM.

3. Implementing the procedures set forth in the Health and Safety Plan, and reporting any deviations from the procedures described in the Plan to the SSO or PM for action.

4. Notifying the PM and SSO of any special medical problems (i.e., allergies) and seeing that all on-site personnel are aware of any such problems.

5. Reviews project health and safety plan and signs acceptance form.

5.0 JOB HAZARD ANALYSIS

The chemicals that will most likely be encountered during this investigation include asbestos, airborne inorganic lead, cadmium, zinc, arsenic, and mercury.

Physical hazards at this work site include those associated with:

- Heat and Cold stress;
- Slip-trip-fall type of accidents;
- Back injuries due to improper lifting;
- Chemicals Brought On-Site (e.g., surfactant, decon soaps, etc.)
- Lifting Hazards
- Confined Spaces (e.g., tunnels with pipe runs)
- Unstable building structures
- Vehicle Safety
- Tick Bites (i.e., Lyme Disease and Rocky Mountain Spotted Fever)
- Poor Lighting
- Protruding Objects

5.1 CHEMICAL HAZARDS FROM SITE

From an occupational health standpoint, given that any potential exposure to site personnel will be only for a short period of time (intermittent for several days) and should be very small or nonexistent in nature due to the use of engineering controls, exposures should not represent a significant concern. However, the site is still under investigation, so the potential for exposure to elevated levels of these contaminants may exist. Overviews of the hazards associated with exposure to the chemicals found on-site to date that may be encountered are presented below in terms of the following types of occupational exposure limits:

PEL	- Permissible Exposure Limit
C	- Ceiling
TLV	- Threshold Limit Value
TLV-STEL	- Short Term Exposure Limit

OSHA Permissible Exposure Limits (PELs) and ACGIH Threshold Limit Values (TLVs), Time Weighted Averages (TWAs) are defined as concentrations for an 8-hour work day, 40-hour work week to which almost all workers can be repeatedly exposed without suffering adverse health effects.

Short Term Exposure Limit (STEL) is defined as the concentration to which workers can be exposed for short time periods without irritation, tissue damage, or narcosis sufficient to likely cause impairment of self-rescue or

precipitate accidental injury. The STEL is a 15-minute time-weighted average that should not be exceeded at any time during the work day.

A ceiling value (C) is a concentration that should not be exceeded at any time in any work day.

Asbestos

PEL = 0.1 f/cc
Excursion Limit = 1 f/cc (30 min)

TLV = 0.5 f/cc (Amosite)
2.0 f/cc (Chrysotile)
0.2 f/cc (Crocidolite)
2.0 f/cc (other forms)

REL = 0.1 f/cc

The OSHA definition of asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated and/or altered. Excessive inhalation of asbestos fibers causes chronic inflammation of lung tissue and pleural membranes. Asbestos fibers can cause a fibrosis of the lung and thickening of the linings of the lung resulting in impaired lung function manifested by breathlessness and increased effort in breathing. OSHA, NIOSH, and ACGIH recognize asbestos as a human carcinogen, primarily linked to lung cancer but also associated with other forms of cancer. Symptoms of asbestos exposure may not appear for many years following initial exposure.

Lead

PEL = 0.05 mg/m^3 Action Level = 0.03 mg/m3 TLV = 0.15 mg/m^3

Acute lead poisoning usually manifests as gastroenteritis. Lead accumulates in the body; chronic lead poisoning is manifested by anemia, constipation, and abdominal pain. Accumulation in the peripheral nerves leads to wrist and ankle drop.

Lead enters the body primarily by inhalation. In the respiratory tract, most lead compounds are absorbed rapidly and stored in nerve tissue so that poisoning can develop from long-term exposure to low doses. Poisoning can also develop slowly from ingestion via lead contaminated food, drink or tobacco products. Prevention of lead poisoning is almost entirely a matter of good personal hygiene and housekeeping.

Cadmium

PEL = 0.005 mg/m^3 TLV = 0.010 mg/m^3

The ACGIH considers cadmium and its compounds as a suspected human carcinogen. The primary routes of exposure to cadmium fumes and dust are inhalation and skin absorption. There is no warning, discomfort or immediate irritation from exposure to cadmium fumes or dust. The acute effects of excessive inhalation include severe tracheobronchitis, pneumonitis, and pulmonary edema, which are life threatening and exhibit symptoms which are usually delayed for several hours. Symptoms of acute overexposure include excessive salivation, a dry, burning throat; headache; aching muscles; coughing; chest tightness and pain; nausea; chills; and fever. Continued overexposure from inhalation of cadmium dust causes irreversible renal tubular damage.

Arsenic and Inorganic Arsenic Compounds

PEL = 0.01 mg/m^3 TLV = 0.2 mg/m^3

Trivalent arsenic compounds are corrosive to the skin. Brief contact has no effect, but prolonged contact with the skin or moist mucous membranes (such as lips or inner eye lids) may result in severe irritation.

Acute (short-term) inhalation may result in coughing, chest pain, and extreme general weakness. If some of the inhaled arsenic is swallowed, inflammation of the GI tract, loss of appetite, and violent vomiting may follow.

Industrial workers who are chronically exposed (long-term) may exhibit a hoarse voice, perforated nasal septum, conjunctivitis, and skin lesions. In prolonged over-exposures peripheral numbness and skin or lung cancer may occur. Target organs include the skin, lungs, liver, kidneys, and lymphatic system.

NIOSH recommends that inorganic arsenicals be treated as a "potential human carcinogen."

Zinc

PEL = 15 mg/m^3 for zinc oxide dust TLV = 10 mg/m^3 for zinc oxide dust

Zinc is an essential element in human nutrition. Intake occurs largely from food, and ranges from 12 to 15 mg/day. Zinc has very low toxicity, and potential exposures to zinc in soils at the site are unlikely to be of toxicological concern.

Inorganic Mercury

TLV = 0.10 mg/m^3 PEL (ceiling) = 0.10 mg/m^3

Chronic exposures to inorganic mercury at levels below the TLV/PEL may lead to excessive irritability (erethism), muscle tremors, loss of appetite and gingivitis. Acute exposure at high levels, which is rare, can cause a variety of gastrointestinal problems and severe anuria (suppression of urine formation), which leads to retention of excessive by-products of protein metabolism in the blood.

Antimony and Compounds

TLV = 0.5 mg/m^3 PEL = 0.5 mg/m^3

Antimony and its compounds are generally regarded as primary skin irritants as well as eyes, nose and throat. Antimony dust is absorbed from the lungs into the blood stream and may affect certain enzyme systems, heart, lungs, and the mucous membrane of the respiratory tract. Symptoms of acute oral poisoning include violent irritation of the nose, mouth, stomach, and intestines, vomiting, bloody stools, slow shallow respiration, pulmonary congestion and death in extreme cases. Chronic exposure symptoms include dry throat, nausea, headache, sleeplessness, loss of appetite, and dizziness. Liver and kidney degradation may also occur at later stages. Only antimony trioxide is classified as a possible human carcinogen.

Routes of Exposure

The following potential exposures may exist at the site:

- Skin contact with contaminated materials;
- Inhalation of vapors or particulates; and
- Ingestion of contaminated materials, especially if poor personal hygiene is practiced.

Skin contact with potentially contaminated soil or water will be minimized by the use of personal protective clothing (as described in Section 7.0). Inhalation of vapors or particulates during sampling will be minimized by the use of engineering controls (e.g., wet methods) and respiratory protection (see Section 6.1). Ingestion of contaminated materials will be minimized by the use of appropriate personal hygiene procedures during decontamination (i.e., thoroughly washing face and hands with soap and water after leaving the work area and prior to eating or drinking).

5.2 EXPLOSIVE AND OXYGEN DEFICIENT ATMOSPHERES

Explosive and/or oxygen deficient atmospheres are not anticipated at the subject site. However, any confined spaces which must be entered should be assessed for explosive and oxygen deficient atmospheres.

5.3 COLD STRESS AND HEAT STRESS RECOGNITION AND CONTROL

The wearing of Personal Protective Equipment (PPE) can place a hazardous waste worker at considerable risk of developing heat stress. This can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, work load, and the individual characteristics of the worker.

Heat stress monitoring should commence when personnel are wearing PPE, including Tyvek-type coveralls, and the ambient temperature exceeds 70°F. If standard work garments (cotton coveralls) are worn, monitoring should commence at 85°F.

Cold stress is going to be of concern at this site. Additional clothing which may be required for warmth may include long underwear, head warmers for hardhats, cloth or leather gloves, jackets, and thick socks. It should be noted that these materials must be laundered prior to leaving the site.

Heat stress monitoring and control guidance can be found in the Attachments.

5.4 NOISE HAZARDS

Noise hazards are not anticipated during this project. However, if noise levels encountered during the subject surveys ever require employees to raise their voice during normal conversation at approximately three (3) feet away from one another, then the employees in this environment shall don hearing protection.

5.5 CONFINED SPACES

CCMR employees will not enter confined spaces (i.e., tunnels with pipe runs, crawlspaces under buildings, etc.) unless it has been determined that the space is free from toxic vapors that might reasonably be expected, adequately ventilated, contains proper oxygen content (21%), and can be easily entered and exited. The CHSO should be contacted prior to entry into any confined space.

5.6 HAZARD COMMUNICATION

Materials which are considered hazardous materials under the OSHA Hazard Communication Standard may be used during this project for decontamination or equipment calibration purposes. In accordance with the CCMR Hazard Communication Program, the MSDSs for the hazardous materials listed below are included in the Attachments. The SSO will make copies of these MSDSs available to any subcontractors on this project, if applicable.

- Liquinox (or equivalent) detergent
- Surfactant

5.7 BIOLOGICAL HAZARDS

Tick bites are a potential serious concern due to their prevalence in the area and their propensity for carrying various diseases. Two important diseases they may carry include Lyme Disease and Rocky Mountain Spotted Fever (RMSF). If bitten remove the tick with tweezers, making certain to remove the pincers and not crush the tick. Wash hands, disinfect area, and dress. If tick cannot be completely removed seek medical attention. Symptoms of Lyme Disease include rash that looks like a "Bull's Eye" several days to weeks after tick bite. Symptoms of RMSF include a rash consisting of red spots under the skin three to ten days after tick bite. Both have symptoms of chills, fever, headache, fatigue, stiff neck, and bone pain.

Rodent droppings and the rodents themselves (especially the Deer Mouse) may carry the Hantavirus. If either of these is encountered leave the area immediately. If these materials must be disturbed, then Level C PPE should be employed including gloves and tyvek.

6.0 EXPOSURE MONITORING PLAN

Heat stress, confined spaces, and hazardous substance exposures may be encountered at this site. Heat stress monitoring and prevention is addressed in Section 5.3. Confined spaces are never to be entered by CCMR employees unless they have been properly assessed and found not to be "Permit-Required" spaces. Chemical exposures are addressed below.

6.1 METALS SAMPLING

Industrial hygiene sampling for lead, cadmium, zinc, and arsenic will be conducted using National Institute of Occupational Safety and Health (NIOSH) methods to characterize employee exposures to these materials while conducting survey activities and working on the site.

An MEI Miniram aerosol monitor will be used for assessing airborne particulate contamination on a real-time basis. The action level (i.e., upgrade from Level D to C) for each area will be based upon the following formula: one-half the PEL (mg/m^3) divided by maximum ppm or mg/kg of material of concern (i.e., lead, cadmium, arsenic, etc.) found in the area times 1,000,000. For example, if the maximum lead level was 860,000 ppm and the PEL was 0.05 mg/m^3 then the action level would be 0.029 mg/m^3. The following table may be used as guidance for action levels at the designated areas. The reading are to be taken in the breathing zone of the employee.

MEI Miniram Action Levels

Location	Action Levels (mg/m^3)*	Time Period	Action
Hillsides	<0.35		Level D
	0.35 - 3.50	> 1 min.	Level C (half-mask)
	>3.50 - 7.00	> 1 min.	Level C (PAPR)
	>7.00	> 1 min.	Stop work; reevaluate
Smelterville Flats	<0.20		Level D
	0.20 - 2.00	>1 min.	Level C (half-mask)
	>2.00 - 4.00	>1 min.	Level C (PAPR)
	>4.00	>1 min.	Stop work; reevaluate
Central Impoundment Area	<0.50		Level D
	0.50 - 5.00	>1 min.	Level C (half-mask)
	>5.00 - 10.00	>1 min.	Level C (PAPR)
	>10.00	>1 min.	Stop work; reevaluate
Page	<1.10		Level D
	1.10 - 10.00	>1 min.	Level C (half-mask)
	>10.00 - 20.00	>1 min.	Level C (PAPR)
	>20.00	>1 min.	Stop work; reevaluate
Smelter Complex[a]	<0.02		Level C (half-mask)
	0.02 - 0.20	>1 min.	Level C (PAPR)
	>0.20	>1 min.	Stop work; reevaluate
Mine Operations Area	<0.07		Level C (half-mask)
	0.07 - 0.70	>1 min.	Level C (PAPR)
	>0.70	>1 min.	Stop work; reevaluate

Adapted from CH2M Hill Health and Safety Plan, 1994.
[a] Includes Lead Smelter area, Magnet Gulch/Deadwood Gulch areas, Phosphoric Acid/Fertilizer Plant areas, and Zinc Plant area.
* above background readings

6.2 MERCURY EXPOSURE

If liquid mercury contamination is encountered (Refer to Attachment A for locations), the cartridges on the air purifying respirator will not be adequate to protect against mercury vapors. If a direct reading instrument (i.e., Jerome Mercury Vapor Analyzer) is not available, then Level B (i.e., supplied air respirator) will be necessary.

6.3 ASBESTOS EXPOSURE

Industrial hygiene sampling for asbestos will be conducted using National Institute of Occupational Safety and Health (NIOSH) methods to characterize employee exposures while conducting survey activities.

6.4 BIOLOGICAL EXPOSURE MONITORING

Blood and urine samples will be collected prior to commencing work activities and after activities have been completed to assess employee exposure levels. The blood and urine will be analyzed for lead, cadmium, arsenic, and zinc.

6.5 OXYGEN DEFICIENT AND EXPLOSIVE ATMOSPHERES

Prior to entering any space where an oxygen deficiency or an explosive atmosphere may exist, an oxygen meter with combustible gas measurement will be used to test for adequate oxygen levels and explosive atmospheres. Decisions will be based on oxygen concentrations as follows:

20.9%	Continue Operations
<20.9%	Continuous Monitoring
<19.5%	Do not enter, ventilate, and determine if supplied air equipment is required
>23.5%	Do not enter, ventilate, and determine if oxygen enriched atmosphere continues to exist.

Decisions will be based on the Lower Explosive Limit (LEL) as determined by the Combustible Gas Indicator as follows:

LEL Reading	Action
<5% LEL	Continue operations
5% - 10% LEL	Continuous Monitoring
>10% LEL	Shutdown Operations and evaluate source, ventilate

6.6 BACKGROUND READINGS

All direct-reading instrument readings will be evaluated relative to background readings, not "meter zero". Prior to the start of work at each shift, and whenever there is a significant shift in wind direction, instrument readings will be obtained upwind of the site work zone in order to determine the level of "background" readings from local vehicle traffic, emissions from nearby operations unrelated to the site, etc. Site readings will be evaluated against these background readings (i.e., if an action level is listed as 0.2 mg/m^3, it is evaluated as 0.2 mg/m^3 above background).

6.7 INSTRUMENT CALIBRATION AND DATA LOGGING

All exposure monitoring data, including background readings, will be logged in the field log book. The results of daily instrument calibrations can either be logged on the form provided in the Attachments or in the field log book. All monitoring instruments will be calibrated, in accordance with the manufacturer's instructions or the guidance found in the Attachments, prior to the start of each shift. Calibration should also be performed when inconsistent or erratic readings are obtained. **If an instrument cannot be calibrated to specification, or becomes otherwise inoperable, all site work which may disturb dust will cease until the instrument is appropriately repaired or replaced**; the PM, CHSO or HSP Preparer should be contacted for further guidance.

6.8 DUST CONTROL

If operations generate sustained visible dust, a water mist will be applied to reduce dust generation. If the mist is not effective in reducing dust generation, personnel will don respirators (half-face or full-face as appropriate for analyzer readings) with High Efficiency Particulate Air (HEPA) cartridges.

7.0 PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment (PPE) levels are designated for various areas on the site in Attachment A. Refer to these guidelines for appropriate PPE at the site.

Minimal PPE (Level D):

- Steel-toed boots with vinyl overboots,
- Safety eyewear,
- Work uniform (to be washed every day),
- Air Purifying Respirator with HEPA cartridge in a bag which is readily available to personnel.

PPE Required When Level C Designated:

- Level D plus,
- Half-mask air purifying respirator with HEPA cartridge, or Powered Air Purifying Respirator (PAPR) when encountering loose asbestos debris.
- Tyvek coverall when sampling in contaminated areas or overhead.
- Surgical gloves when sampling contaminated areas

7.1 LIMITATIONS OF PROTECTIVE CLOTHING

The protective equipment ensembles selected for this project are anticipated to provide protection against the types and concentrations of hazardous materials that may potentially be encountered during field operations. However, no protective garment, glove or boot is resistant to all chemicals at any concentration; in fact, chemicals may continue to permeate or degrade a garment even after the source of contamination is removed.

In order to obtain optimum usage from PPE, the following procedures are to be followed by all Converse Consultants Mountain Region, Inc. personnel:

- When using disposable coveralls, don a clean, new garment after each rest break or at the beginning of each shift;

- Inspect all clothing, gloves and boots both prior to and during use for:

  - Imperfect seams
  - Non-uniform coatings
  - Tears
  - Poorly functioning closures

- Inspect reusable garments, boots and gloves both prior to and during use for:

  - Visible signs of chemical permeation such as swelling, discoloration, stiffness or brittleness

  - Cracks or any signs of puncture or abrasion

Any reusable garments exhibiting any such characteristics will be discarded.

7.2 DURATION OF WORK TASKS

The duration of work tasks in which personnel use PPE ensembles that include chemical protective clothing (including uncoated Tyvek) will be established by the SSO. Variables to be considered include ambient temperature and other weather conditions, the capacity of individual personnel to work in the required level of PPE in heat and cold, and the limitations of specific PPE ensembles. The minimum rest breaks are as follows:

- Fifteen minutes midway between shift startup and lunch
- Lunch break (30 to 60 minutes)
- Fifteen minutes midway between lunch and shift end

Rest breaks are to be taken in the support zone or other clean area after personnel have completed the decontamination process, including soap and water wash of hands and face. Additional rest breaks will be scheduled according to heat stress monitoring protocols as described in the Attachments.

8.0 SITE CONTROL

The site is secured by fencing and access is limited to gates manned by security personnel. Only authorized personnel are allowed onto the site. Any personnel entering the site will have appropriate training and be medically qualified.

Keep all nonessential personnel and bystanders out of the area or room when sampling is being conducted. Clean up any debris generated during sampling before leaving the area and dispose of it properly.

The site is broken up into three general zones which consist of the following:

- Exclusion Zone (EZ) - This zone is where potentially hazardous contaminants and physical hazards to the workers will be contained. Full personal protection will be required in this area. The Exclusion Zone will encompass all buildings on the site which are to be assessed.

- Contamination Reduction Zone (CRZ) - The CRZ will consist of the decontamination trailer located at the Phosphoric Acid Plant. All decontamination activities will occur in the CRZ. A waste container will be placed in the zone for waste PPE. No CCMR personnel will be permitted into the CRZ or EZ unless they are in full compliance with the requirements of this Plan.

- Support Zone (SZ) - The SZ will consist of the clean side of the decontamination trailer, the Phosphoric Acid Plant and the Pintlar offices. Support equipment is located in this uncontaminated or clean area. Normal work clothes are appropriate within this zone. The location of this zone depends on factors such as accessibility, wind direction (upwind of work area), and resources (i.e., roads, shelter, utilities).

9.0 DECONTAMINATION PROCEDURES

Decontamination will be conducted at the decontamination trailer located at the Phosphoric Acid Plant. Contaminated boots and gloves will be rinsed off prior to removal and all protective clothing will be removed in a manner to reduce dust generation. All clothing and PPE worn on site will remain on site until they are completely decontaminated at the end of the project. Uniforms will be laundered on site by the appropriate contractor on a daily basis. All personnel will shower prior to redressing in their street clothes.

The following steps will be followed whenever personnel leave the exclusion zone/work area after having become contaminated:

1. Remove all equipment, sample containers, and notes to the CRZ. Obtain decontamination solutions and decon the tools by brushing them under a water rinse. All waste and spent decon solutions will be properly contained.

2. Scrub boots and gloves with a stiff bristle brush and water. Washtubs and chairs will be provided.

3. Remove outer gloves (and boot covers, if used).

4. Remove Tyvek coverall; discard in provided container.

5. Remove hardhat and eye protection.

6. Remove respirator.

7. Remove inner gloves.

8. Shower in decon trailer.

9.1 RESPIRATOR MAINTENANCE

Each worker will be responsible for cleaning, sanitizing and storing their own respirator in accordance with manufacturer's guidance (i.e., washing in warm water and detergent or sanitizing solution, air drying, and storing in a plastic storage bag; see Attachments). Cartridges will be changed as soon as increased breathing resistance is encountered and at the end of each shift. Respirators will be kept in storage bags or boxes when not in use.

All spent decontamination fluids (rinse waters, etc.) shall be handled as directed by the PM and in accordance with relevant regulations.

9.2 SANITATION

Potable water will be made available at the site, either from a pressurized source or commercially-available bottled water. Drinking cups will be supplied so personnel will neither drink directly from the source of water nor have to share drinking cups. Sources of non-potable water shall be clearly labeled as such.

Unless toilet facilities are available on site or transportation is readily available to transport personnel to nearby (within five minutes) toilet facilities, portable toilet facilities, such as chemical toilets, will be provided on site.

Washing facilities will be provided on site. Soap, clean water, wash basins and single-use towels will be available for personnel use.

9.3 DECONTAMINATION OF TOOLS

All sampling equipment will be decontaminated prior to being used and between sampling intervals. The tools will be wiped with pre-moistened towelettes between sampling points. All visible particles are to be removed before the tool is considered clean.

10.0 SAFE WORK PRACTICES

10.1 GENERAL

1. Wet methods (e.g., spray bottle with water and surfactant) will be used during sampling of potential asbestos-containing building materials to prevent airborne dust of these materials.

2. Eating, drinking, chewing gum or tobacco, and smoking are prohibited in the contaminated or potentially contaminated area or where the possibility for the transfer of contamination exists.

3. Personnel will wash their hands and face thoroughly with soap and water prior to eating, drinking or smoking.

4. Avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, etc. Avoid, whenever possible, kneeling on the ground, leaning or sitting on equipment or ground. Do not place equipment on potentially contaminated surfaces (i.e., ground, etc.)

5. All field crew members should make use of their senses to alert them to potentially dangerous situations in which they should not become involved (i.e., presence of strong, irritating or nauseating odors).

6. All wastes generated during site activities will be disposed of as directed by the PM (i.e., as hazardous wastes unless shown not to be).

7. All personal protective equipment will be used as specified and required.

8. The buddy system will be used when performing sampling for hazardous materials where a potential serious injury exists (e.g., climbing unsecured ladders to reach a roof, crawling through an attic, etc.).

9. Personnel are to immediately notify the SSO or Site Manager if any indications of unusual potentially hazardous conditions are observed (e.g., unusual odors, asbestos debris, etc.).

10. All collected samples will be stored in airtight pliable plastic containers (i.e., ziplock baggies) or in airtight canisters.

10.2 SAMPLING PRACTICES

For all sampling activities, the following standard safety procedures shall be employed:

1. All sampling equipment should be cleaned before proceeding to the site.

2. At the sampling site, sampling equipment should be cleaned after each use.

3. Work in "cleaner" areas should be conducted first where practical.

4. All unauthorized personnel will remain outside area during sampling.

11.0 EMERGENCY RESPONSE PLAN

It is Converse Consultants Mountain Region, Inc. (CCMR) policy to evacuate personnel from areas involved in hazardous material emergencies and to summon outside assistance from agencies with personnel trained to deal with the specific emergency. This section outlines the procedures to be followed by CCMR personnel in the event of a site emergency.

In the event of a fire or medical emergency, the following numbers can be called for assistance:

Hospital:	784-1221
Fire:	911
	784-1188 (Kellogg)
	752-1123 (Wallace)
Ambulance:	911
	784-1188
Police:	911
	753-3000

Hospital Directions:

The Shoshone Medical Center is located at Jacobs Gulch in Kellogg, ID. From the decontamination area in the Phosphoric Acid Plant area at the site go north through the security gate to McKinley Avenue. Turn west on McKinley and proceed to I-90 access road. Turn right and get on I-90 going east. Proceed to the Bunker Avenue exit and turn left (north) on Bunker Avenue going under I-90. The hospital will be on the right. Follow Emergency Room direction signs.

Paramedics should be summoned in the event of a serious injury; they will arrange to transport the victim to the nearest appropriate facility. A first aid kit will be available at the site for use in case of minor injuries. If direct contact with contaminants occurs, affected skin areas should be washed immediately with soap and water.

In the event of serious trauma or unknown chemical exposure, the employee should be stabilized by one group of employees while the emergency phone number list is consulted and an ambulance immediately requested.

Workers with suspected back or neck injuries are NOT to be moved until professional emergency assistance arrives.

At least one person at the site will have current certification in First Aid and CPR.

11.1 PLACES OF REFUGE

In the event of a site emergency requiring evacuation, all personnel will evacuate to the decontamination trailer at the Phosphoric Acid Plant. Personnel will proceed upwind of any visible releases or fires or other hazardous conditions during an emergency. All personnel should be accounted for by the SSO to ensure that no personnel have been left behind. The SSO will designate the assembly area prior to the start of work.

11.2 INCIDENT REPORT

In the event of an injury or illness, work is to be stopped until the SSO and the CHSO (Dale Walsh-Las Vegas) have determined the cause of the incident and have taken the appropriate action. Any injury or illness, regardless of severity, is to be reported on the accident report form (see Attachments).

11.3 COMMUNICATION

A communication network must be set up to alert site personnel of emergencies and to summon outside emergency assistance. Where voice communication is not feasible an alarm system (i.e., sirens, horns, etc.) should be set up to alert employees of emergencies. Radio communication will be used to communicate with personnel in the exclusion zone. Telephones are available in the office areas. Site personnel should be trained on the use of the site emergency communication network. Emergency phone numbers should be posted at the phone or radio used for outside communication. The SSO is responsible for establishing the communication network prior to the start of work, and for explaining it to all site personnel during the site safety briefing.

The following hand signals will be used by personnel in the event of an emergency:

Signal	Definition
Hands clutching throat	Out of air/can't breathe
Hands on top of head	Need assistance
Thumbs up	OK/I'm alright/I understand
Thumbs down	No/negative
Arms waving upright	Send back support
Grip partner's wrist	Exit area immediately

In the event of an emergency, the Site Safety Officer will verbally instruct personnel either in person or on the radio to leave the site when conditions warrant or when instructed to do so by site personnel on the radio.

12.0 TRAINING

Personnel conducting asbestos inspections shall have attended, at a minimum, the 24 hour EPA approved asbestos building inspector course per AHERA guidelines. Personnel shall also be made aware of the hazards, control techniques, and symptoms of exposure associated with asbestos, lead, cadmium, arsenic, zinc, and mercury. This information can be found earlier in this HSP.

All Converse Consultants Mountain Region, Inc. (CCMR) site personnel will have met the requirements of 29 CFR 1910.120 (e), or State equivalent, including:

- Forty hours or initial off-site training or its recognized equivalent;
- Eight hours of annual refresher training for all personnel;
- Eight hours of supervisor training for personnel serving as Site Safety Officers and Project Managers;
- Three days of work activity under the supervision of a trained and experienced supervisor.

In addition, all CCMR site personnel will review this HSP and sign a copy of the safety plan compliance agreement, which is found in the Attachments. The PM will maintain these agreements at the site, and forward them to the CHSO at the conclusion of the operation.

Prior to the start of operations at the site, the SSO will conduct a site safety briefing, which will include all personnel involved in site operations. At this meeting, the SSO will discuss:

- Contents of this HSP,
- Types of hazards at the site and means for minimizing exposure to them,
- The type of monitoring that will be performed,
- Action levels for upgrade and downgrade of personal protective equipment,
- Personal protective equipment that will be used,
- Decontamination protocol,
- Site control measures, including safe operating practices and communication,

- Location and use of emergency equipment, and
- Evacuation signals and procedures.

Subsequent site safety briefings will be conducted prior to each shift to review pertinent safety issues, discuss any problems, and outline safety aspects of the shift's tasks. For each briefing, the SSO will complete a Site Safety Briefing form (see Attachments) and maintain them in the project files.

13.0 MEDICAL SURVEILLANCE

All CCMR site personnel are participating in medical surveillance programs that meet the requirements of 29 CFR 1910.120 (f), and asbestos, lead, cadmium, and arsenic standard requirements, or State equivalents. All personnel will be medically qualified to wear a respirator. The PM will maintain current copies of statements of medical program participation for all site personnel.

Medical monitoring for blood and urine levels of lead, arsenic, cadmium, and zinc will be conducted before the project begins and at its conclusion. Additional testing may be necessary if signs of overexposure are being experienced by personnel during work activities. The samples will be collected by on-site resources.

14.0 RECORDKEEPING

The PM or SSO will maintain current copies of training certificates and statements of medical program participation for all site personnel.

Records of respirator fit testing conducted within the last six months will also be maintained by the PM or SSO.

The PM and SSO are responsible for site recordkeeping. Prior to the start of work, they will review this plan; if there are no changes to be made, they will sign the approval form and forward a copy to the CHSO.

All CCMR personnel will review the HSP and sign the plan acceptance form in Attachment A; copies of these forms will be maintained in the project file.

The SSO will conduct a Site Safety Briefing in accordance with Section 12.0 prior to each shift and have all attendees sign the form in Attachment E.

Any accident or exposure incident will be investigated and the form in Attachment D will be completed and forwarded to the office administrative manager and the CHSO.

Records of instrument calibration (Refer to Attachment I) shall be maintained on a daily basis.

PPE use and changes, health and safety-related issues, and deviations from or problems with this HSP will be recorded in the Field Log.

GLOSSARY OF TERMS, ACRONYMS, AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
AHERA	Asbestos Hazard Emergency Response Act
analyzer	Refers to the field instrument described in Section 6.1
atm	Atmosphere (measure of pressure)
°C	Degrees centigrade
Carcinogen	A substance that can cause cancer
cc	Cubic centimeter
CGI	Combustible Gas Indicator
CNS	Central Nervous System
CHSO	Corporate Health and Safety Officer
EPA	U.S. Environmental Protection Agency
°F	Degrees Fahrenheit
GM	General Manager
HSP	Health and Safety Plan
kg	Kilogram
LEL	Lower Explosive Limit
lpm	Liters per minute
MSDS	Material Safety Data Sheet
m	Meter
mg	Milligram
mg/m^3	Milligram per cubic meter
ml	Milliliter
mm	Millimeter
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
OBZ	Operator's Breathing Zone
OHSO	Office Health and Safety Officer
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PM	Project Manager
ppb	Parts per billion
ppm	Parts per million
REL	Recommended Exposure Limit
SSO	Site Safety Officer
SSR	Subcontractor's Safety Representative
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
UEL	Upper Explosive Limit
VOC	Volatile Organic Compound

ATTACHMENT A

HAZARDS AND PPE SUMMARY OF SITE

Zinc Plant Hazards

Location	Physical Hazard	Chemical	Level of Protection
Carpenter Shop (DRUMS) (Pallets)	Good condition	Hg Hg, Pb, Zn Sb, As, Pb Zn	Level B Level B Level C
Concentrate Handling Building Contaminated waste stored	Good Condition	Pb, Zn	Level D
Zinc Plant Conveyer Area	unknown	Pb, Zn	Level D
Flash Roaster Roaster Building Inside Bldg	Good Condition	Asbestos, insul (outside Bldg) Zn	Level C Level D
Boiler House	Good Condition	Asbestos, upper level	Level C
Roaster Building	Good Condition	Zn, Pb	Level D
Thickener Tanks	Fair Condition	Cd, Pb, Zn	Level C/D
Residue Floor	Floor/Columns, Good Walls/Roof Fair	Pb	Level C/D
Near Burt Tanks	Condition	Pb, Cd, Zn	Level C
Framing Shed	Good Condition	Hg	Level B
Anode cleaning bldg	Demolished/debris remaining	Pb	Level C

Zinc Plant Hazards

Location	Physical Hazard	Chemical	Level of Protection
Cell Room (Shell remains)	Poor Condition	Pb, Zn	Level D
Mangenese Dioxide Room	Poor Condition	Pb	Level D
Tanks		Pb	Level D
Cadmium Plant	Poor Condition	As, Cd, Pb, Zn	Level C
Acid Plant Area	Good Condition	Asbestos (Pipes)	Level C
Plant 1 Floor		Hg, Zn	Level B
Thaw Shed	Floor/Poor Remainder/Fair Cond	Pb	Level D
Roaster Floor 2nd Level	Floors/Columns Good Walls/Fair Condl	Pb, Zn	Level D
Top Level	Floor/Walls Fair Rest/Good		Level D
Bottom Level	Good Condition		
Concentrate Unloading	Floors/Poor Walls/Fair Remainder/Good	Zn, Pb	Level D
Leach Floor Insul/Tank 5	Good Condition	Asbestos	Level C
Purification Tank Floor Majority of tanks removed	Good Condition	As, Pb, Zn	Level C
Balloon Flue	Fair Condition	Zn, Pb	Level D
Outside Accum Pile		Zn, Pb	Level D

Zinc Plant Hazards

Location	Physical Hazard	Chemical	Level of Protection
Old Cottrell	Good Condition	Cd, Pb, Zn	Level C
Drossing Plant (structures/scrap metal removed)	Floors/Columns Fair Walls/Poor Roof/Good Cond	Zn	Level D
Mercury PPT Building	Walls/Fair Remainder/Good Cond	Hg	Level B
Mist Precipitator	Good Condition	Pb, Hg	Level B

Zinc Plant Hazards

Location	Physical Hazard	Chemical	Level of Protection
Outdoor Pile			
2-20-3		Zn, Pb	Level D
2-20-4		Zn, Pb	Level D
2-20-5		Zn, Pb	Level D
2-20-6		Zn, Pb	Level D

Lead Smelter Hazards

Location	Physical Hazards	Chemical Hazards	PPE
Bedding/pelletizing Plant	Good Condition	Pb	Level C
Sinter Plant	Good Condition	Cd, Pb	Level B/C
Lurgi Baghouse	Good Condition unstable catwalks, insul. falling from exterior	Cd, Pb, Hg	Level B
Car Loading bins (small amount of timber removed)	Floors good condition Walls, Columns, Roof fair–poor cond	Cd, Pb	Level B/C
Blast Furnace	Good Condition	Pb, Cd, Sb, As	Level B/C
Lead Refinery	Good condition	Pb, As, Sb, Cd	Level B/C
Slag Fuming Plant	Floor, walls, columns good condition. Roof, good except fire damage SW corner	Asbestos	level C
Cupel Room	Floors, walls, columns good condition Roof, poor–good	Sb, As, Pb	Level C
Brick Shed	Good Condition	Asbestos	Level C
Electric Furnace Building	Floor, good cond Walls, columns, roof fair condition	Sb, As, Pb	Level C

Lead Smelter Hazards

Location	Physical Hazards	Chemical Hazards	PPE
Paint Shop	Poor shape mod fire damage	Asbestos	Level C
Wheelabrator	Good condition	Asbestos As, Cd, Pb	Level B/C
Main Baghouse	Condition poor	Cd, Pb	Level B/C
Filter Cleaning Shed	Good condition	Sb, As, Pb	Level C
Acid Plant	Good condition	Pb	Level C
Warehouse	Good condition	Asbestos	Level C
Railroad Bed	unknown	As, Sb, Pb	Level C
Concentrates/Ore Bins (small amt of timber removed)	Good Condition Weak planking/track	Pb	Level C
Norblo Baghouse	Good condition	Sb, As, Pb, Cd	Level B/C
Crushing Plant	Good Condition	Pb	Level C
Zn Oxide Baghouse	Good condition	Pb	Level C
Brick Flue	Poor condition abandoned in 1977	Cd, Pb	Level B/C

Lead Smelter Hazards

Location	Physical Hazards	Chemical Hazards	PPE
Bag House	Poor Condition	Cd, Pb	Level C
Carpenter Shop & Framing Shop	Good condition	Pb	Level C
Roundhouse	Good Condition	Pb	Level C
Lurgi above ground tank	Removed/sludge remains	Cd, Pb	Level B/C
Ag refinery tank	unknown	Pb	Level C
Central Loading/Unloading Area from N–E end Smelter	unknown	Pb	Level C
Concentrate Thaw Shed	Building Removed	Pb	Level C
Preparation Plant (Asbestos is stored on the bottom floor)	Good Condition	Asbestos (exterior of bldg) Pb	Level C
Storage Area W of Smelter Bldg	unknown	Pb, Sb	Level C
Reverberatory Furnace	unknown	Sb, As, Pb	Level C
Electrolytic	Good Condition standing water on floor	Sb, As, Pb	Level C

ATTACHMENT B

SAFETY PLAN COMPLIANCE AGREEMENT

ATTACHMENT B

SAFETY PLAN COMPLIANCE AGREEMENT
FOR
ASBESTOS ASSESSMENT
BUNKER HILL SUPERFUND SITE
KELLOGG, IDAHO

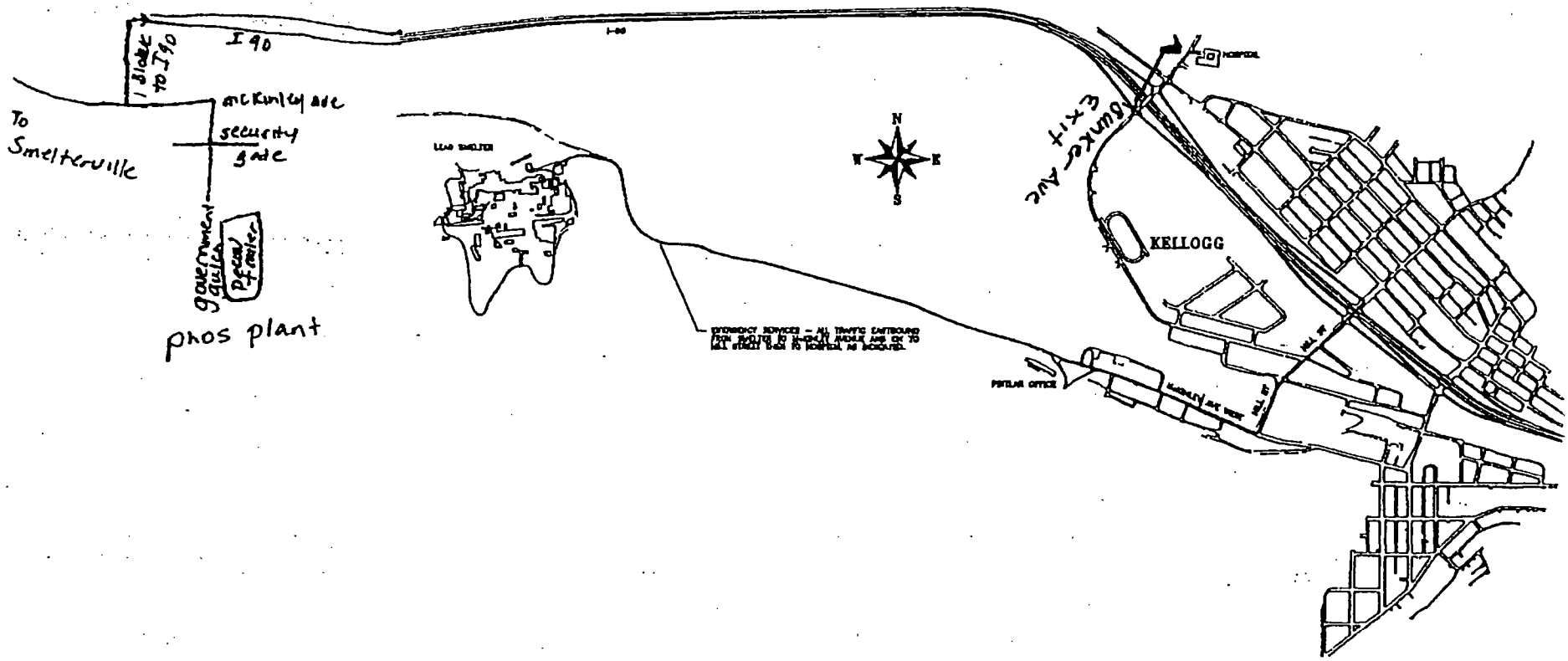
I, _____, have reviewed the Health and Safety Plan for the Project, understand it, and agree to comply with all of its provisions. I understand that I could be prohibited from working on the project for violating any of the health and safety requirements specified in the plan.

SIGNED: _____ _____
(Signature) (Date)

Firm: Converse Consultants Mountain Region, Inc.

ATTACHMENT C

HOSPITAL ROUTE MAP


I 90
1 block to I90
McKinley Ave
security gate
To Smelterville
government guide post center
phos plant
Burke Ave
Exit
N
W
E
S
KELLOGG
POSTAL OFFICE

ATTACHMENT D

ACCIDENT REPORT FORM

ACCIDENT/EXPOSURE REPORT

EMPLOYEE NAME _____ DATE OF BIRTH _____

HOME ADDRESS _____ PHONE NO. _____

SEX: MALE____ FEMALE____ JOB TITLE _____ SOCIAL SECURITY NO. _____

OFFICE NO. _____ OFFICE LOCATION _____ DATE OF HIRE _____

HOURS USUALLY WORKED: HOURS PER DAY _____ HOURS PER WEEK _____ TOTAL HOURS WEEKLY _____

WHERE DID ACCIDENT OR EXPOSURE OCCUR? (INCLUDE ADDRESS) _____

_____

COUNTY _____ ON EMPLOYER'S PREMISES? YES_____ NO_____

WHAT WAS EMPLOYEE DOING WHEN INJURED? (BE SPECIFIC) _____

_____

HOW DID THE ACCIDENT OR EXPOSURE OCCUR? (DESCRIBE FULLY) _____

_____

_____

_____

WHAT STEPS COULD BE TAKEN TO PREVENT SUCH AN OCCURRENCE? _____

_____

_____

OBJECT OR SUBSTANCE THAT DIRECTLY INJURED EMPLOYEE _____

_____

DESCRIBE THE INJURY OR ILLNESS _____ PART OF BODY AFFECTED _____

NAME AND ADDRESS OF PHYSICIAN _____

IF HOSPITALIZED, NAME AND ADDRESS OF HOSPITAL _____

DATE OF INJURY/ILLNESS _____ TIME OF DAY _____ LOSS OF ONE OR MORE DAY OF WORK? YES/NO _____

IF YES-DATE LAST WORKED _____

HAS EMPLOYEE RETURNED TO WORK? _____ IF YES-DATE RETURNED _____ DID EMPLOYEE DIE? _____ IF YES-DATE _____

COMPLETED BY (PRINT) _____ SIGNATURE _____

TITLE _____ DATE _____

An accident/exposure report must be completed by the supervisor or site safety officer immediately upon learning of the incident.

ATTACHMENT E

SITE SAFETY BRIEFINGS

SITE SAFETY BRIEFINGS

Job Name_____ Number _____

Date_____ Start Time_____ Completed _____

Site Location_____

Type of Work (General)_____

****

SAFETY ISSUES

Tasks (this shift)_____

_____

Protective Clothing/Equipment_____

_____

Chemical Hazards_____

_____

Physical Hazards_____

_____

Control Methods_____

_____

_____

Special Equipment/Techniques_____

_____

Nearest Phone_____

Hospital Name/Address_____

Special Topics (incidents, actions taken, etc.)_____

_____

_____

****

ATTENDEES

Print Name	Sign Name
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Meeting conducted by: _____

ATTACHMENT F

COLD STRESS AND HEAT STRESS GUIDANCE

COLD STRESS AND HEAT STRESS MONITORING AND CONTROL

Signs, Symptoms and First Aid

Heat rash (prickly heat) may result from continuous exposure to heat or humid air. It appears as red papules (elevated skin lesion), usually in areas where the clothing is restrictive, and gives rise to a prickly sensation, particularly as sweating increases. It occurs in skin that is persistently wetted by unevaporated sweat. The papules may become infected unless treated.

First Aid for Heat Rash - to prevent heat rash: shower after work, dry off thoroughly, and put on clean, dry underwear and clothes. Try to stay in a cool place after work. If, in spite of this, you develop heat rash, see your physician.

Heat Cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:

- muscle spasms
- pain in the hands, feet and abdomen

First Aid for Heat Cramps - leave the work area, and rest in a cool, shaded place. Drink one or two glasses of electrolyte replacement drink, and try to gently massage the cramped muscle. Once the spasms disappear, you may return to work; taking adequate breaks and drinking electrolyte replacement drink should prevent the cramps from returning.

Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

- pale, cool, moist skin
- heavy sweating
- dizziness
- nausea
- fainting

The key here is that the victim is still sweating, so the cooling system is still working; it's just under severe stress. The body core temperature should still be near normal. It is important to recognize and treat these symptoms as soon as possible, as the transition from heat exhaustion to the very hazardous heat stroke can be quite rapid.

First Aid for Heat Exhaustion - leave the work area immediately, go through decon and remove all chemical protective clothing. Rest in a cool, shaded place and open your clothing to allow air circulation; lay flat except when taking fluids. Drink plenty of cooled electrolyte replacement drinks. Your work is over for the day; do not attempt to return. Medical assistance should be summoned.

Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms are:

- red, hot, usually dry skin
- lack of or reduced perspiration
- nausea
- dizziness and confusion
- strong, rapid pulse
- coma

First Aid for Heat Stress - THIS IS A MEDICAL EMERGENCY! SUMMON MEDICAL ASSISTANCE IMMEDIATELY! Remove the victim from the work area, perform a gross decon, and remove all PPE. Have the victim lie down in a cool, shady area. Attempt to bring the victim's temperature down by increasing air movement (electric fan) or placing wetted sheets or towels on them. Place an ice bag on the victim's head. The victim must not be sent home or left unattended without a physician's specific order.

Heat Stress Prevention

The best approach to avoiding heat-related illnesses is through preventative heat stress management. The site manager and site safety officer are responsible for implementing this program.

Rest areas - a relatively cool, shaded area must be provided for breaks when ambient temperatures exceed 70°F and workers are wearing chemical protective clothing (including uncoated Tyvek), or if temperatures exceed 85°F and workers are wearing "Level D" coveralls or work clothes. A car or van is an oven, not a rest area. The rest area should be located in the support zone adjacent to the contamination reduction zone. . If shade is not available, build some: use a plastic "dining canopy", which can be obtained at sporting goods stores. This same type of canopy can be set up to shade personnel performing hand augering in hot weather.

Liquids - encourage employees to drink cool electrolyte replacement drinks, such as Gatorade, Squench or Quick-kick (drink), frequently. Plain water is ok, but replacement drinks are preferred. OSHA prohibits a "community cup"; use paper cups. Have workers drink 16 ounces of drink before beginning work, such as in the morning and after lunch. At each break, workers should take 8-16 ounces of drink. Don't wait until you are thirsty to drink.

Discourage the use of alcohol during non-working hours, and discourage the intake of coffee during work hours, as these make heat stress control more difficult.

Acclimatization - this is the process by which your body "gets used to" hot work environments. This is achieved by slowly increasing workloads. Start at 50 percent capacity on day one, and increase by 10 percent per day; on day six, you'll be at 100 percent. You don't loose acclimatization over a weekend, but it'll start to decrease after three to four days. If you don't do hot work for

a week, it is gone. You don't have to do full shift hot work to achieve or retain acclimatization; a minimum of 100 minutes of continuous hot work exposure per day is adequate.

Heat Stress Monitoring

For field operations that are part of ongoing site work activities in hot weather, the following procedures shall be used to monitor the body's physiological response to heat, and to monitor the work cycle of each site worker. There are two phases to this monitoring: initial work/rest cycle determination, and physiological monitoring. The initial work/rest cycle is used to estimate how long the first work shifts of the day should be. Heart rate monitoring of each worker will establish the length of the successive work periods. This monitoring should commence when ambient (not adjusted) temperatures exceed:

- 70°F for personnel wearing chemical protective clothing, including Tyvek coveralls
- 85°F for personnel wearing normal work clothes

DETERMINATION OF THE INITIAL WORK/REST CYCLES

Measure the air temperature with a standard thermometer with the bulb shielded from radiant heat; this yields T (actual). Estimate the fraction of sunshine by judging what percent time the sun is not shielded by clouds that are thick enough to produce a shadow. 100 percent sunshine - no cloud cover = 1.0; 50 percent sunshine - 50 percent cloud cover = 0.5; 0 percent sunshine - full cloud cover = 0.0.

Plug these variables into the following equation to determine the adjusted temperature:

$$T\ (\text{adjusted}) = T\ (\text{actual}) + (13 \times \text{fraction sunshine})$$

Use the chart below to determine the length of the first work shift. At the first break, initiate the heart rate monitoring as described in the next section.

INITIAL WORK/MONITORING CYCLES

ADJUSTED TEMPERATURE	NORMAL WORK CLOTHES	PROTECTIVE CLOTHING
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5°-90°F (30.8°-32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5°-87.5°F (28.1°-30.8°)	After each 90 minutes of work	After each 60 minutes of work
77.5°-82.5°F (25.3°-28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5°-77.5°F (22.5°-25.3°C)	After each 150 minutes of work	After each 120 minutes of work

Heart Rate Monitoring

Heart rate (HR) should be measured by radial pulse for 30 seconds as early as possible in the resting period, preferably immediately after decon has been completed. The HR at the beginning of the rest period should not exceed 110 beats/minute. If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats/minute at the beginning of the next rest period, the following work period should be further shortened by 33 percent, while the length of the rest period stays the same.

Cold Stress

Exposure to cold working conditions can result in cold stress (hypothermia) and/or injury (frostbite) to hands, feet, and head. Hypothermia can result when the core body temperature drops below 36°C (96.8°F) Lower body temperature will very likely result in dizziness, drowsiness, disorientation, slurred speech, or loss of consciousness, with possible fatal consequences. Pain in the extremities may be the first warning of danger to cold stress. Shivering develops when the body temperature has fallen to 35°C (95°)F.

Hypothermia can be brought on by exposure to cold air, immersion in cold water, or a combination of both. Wind chill factor, the cooling power of moving air, is a critical factor in cold stress. The following table is an equivalent chill (ec) temperature chart relating actual air temperature to ec temperature at various wind speeds.

Adequate insulating clothing must be worn by workers if work is performed in ec temperatures below 4°C (40°F). At ec temperatures of 2°C (35.6°F or less), workers whose clothing becomes wet should be immediately provided with a change of clothing and if necessary, treated for hypothermia. Treatment includes warming the victim with skin-to-skin contact, or by providing warm blankets or other coverings, and drinking warm liquids. Skin exposure should not be permitted at ec temperatures of -32°C (-25°F) or below.

If fine work is to be performed with bare hands for more than 10 to 20 minutes at ec temperatures below 16°C (60°F), provisions should be made for keeping the workers' hands warm. If ec temperatures fall below 40°F and fine manual dexterity is not required, then gloves should be worn. Metal handles of tools should be covered with insulating material at air temperatures below -1°C (30°F).

ATTACHMENT G

MATERIAL SAFETY DATA SHEETS

MATERIAL SAFETY DATA SHEET

GENIUM PUBLISHING CORPORATION
1145 CATALYN STREET
SCHENECTADY, NY 12303-1836 USA
(518) 377-8855

GENIUM PUBLISHING CORP.

NO. _____

TRISODIUM PHOSPHATE DODECAHYDRATE

Date November 1978

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: TRISODIUM PHOSPHATE DODECAHYDRATE
DESCRIPTION: Crystallizes from water as $Na_3PO_4.12H_2O$ and can exist as several hydrate forms, depending on processing, and as the anhydrous salt.
OTHER DESIGNATIONS: TSP, Trisodium Orthophosphate, Sodium Phosphate, Tribasic, Tertiary Sodium Phosphate, GE Material D4K1, ASTM D538, CAS# 007 601 549
MANUFACTURER: Available from several suppliers, including FMC Corporation, Monsanto Co., Stauffer Chemical Co., and Olin Corp.

SECTION II. INGREDIENTS AND HAZARDS	%	HAZARD DATA
Trisodium Phosphate (as $Na_3PO_4.12H_2O$)	>97	No TLV established*
		($Na_3PO_4.12H_2O$) Rat, Oral LD_{50} 7400 mg/kg

*Under OSHA inert dust limits it can be assumed that airborne particulate, not otherwise controlled, is limited to a maximum of 5 mg/kg of respirable dust; however, this level may not be adequate to prevent irritation with this material.

SECTION III. PHYSICAL DATA

Boiling point ———— -11 H_2O at 100 C (decomposes)
Melting point, deg C — >73.3 (dec)
Solubility, g/100g H_2O:
at 0 C ———— 1.5
at 15 C ———— 28.3
at 70 C ———— 157

Specific gravity (20/4 C) ———— 1.62
pH of 1% water solution at 25 C — ca 12
Molecular weight ———— 380.1

Appearance & Odor: White or colorless crystalline solid (also as powder flake, granules, etc.). No odor.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
None	None	None		

Extinguishing Media: Use that which is appropriate to the surrounding fire; this material is non-combustible.
In a fire situation at high temperature phosphates can emit highly toxic phosphorus oxide fumes. Firefighters should use self-contained breathing apparatus.

SECTION V. REACTIVITY DATA

This material is a stable alkaline solid at room temperature. It does not undergo hazardous polymerization.
It is incompatible with acidic materials.

SECTION VI. HEALTH HAZARD INFORMATION

TLV None established (See Sect II)

This alkaline material will cause irritation to the respiratory tract if inhaled as a dust or as a solution mist. Prolonged or repeated skin contact will irritate the skin. Eye contact will irritate and can damage the eyes (alkaline attack). This material is low in toxicity by ingestion, but its alkaline nature will irritate, injure the digestive tract. (Trisodium phosphate is used as a food additive; but it must be reduced in alkalinity before being taken into the body.)

FIRST AID:

Eye contact: Promptly flush with plenty of water for 15 minutes. Get medical help.

Skin contact: Wash well with soap and water; rinse well with water. If irritation persists, get medical help.

Inhalation: Remove to fresh air. Get medical help if irritation persists.

Ingestion: Give 1-2 glasses of water or milk to drink to dilute; then give fruit juice or diluted vinegar to drink. Do not induce vomiting! Immediately contact a physician.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

For large spills, notify safety personnel. Clean-up personnel should use protection against contact or inhalation of dust or mist. Scoop up spill for recovery or disposal and place in a container with a lid. Flush residues to the sewer with plenty of water.

DISPOSAL: Scrap material can be used for neutralizing acidic wastes, or it can be buried in an approved manner in an approved landfill. Small amounts can be flushed to the sewer if regulations permit., Follow Federal, State and local regulations for disposal.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide general ventilation to the workplace: if dusting conditions occur, local exhaust ventilation will be needed and a NIOSH approved dust respirator may be required.

The use of rubber or plastic gloves and chemical safety glasses with side shields is recommended for handling this material. An apron may also be desirable to prevent contact with clothing, especially where solutions are involved.

Provide eyewash station near to the workplace where this material is used; a safety shower may also be needed where large amounts of solution are prepared or used.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Store this material in tightly sealed containers in a clean, dry, ventilated area. Prevent physical damage to containers.

Avoid contact with the body and inhalation of dust.

Note that anhydrous trisodium phosphate and lower hydrates are more alkaline on a weight basis than $Na_3PO_4 \cdot 12H_2O$.

APPROVALS:	
MIS, CRD	J. M. Dorsey
Industrial Hygiene and Safety	J. H. White
Corporate Medical Staff	Joseph F. Mattiello MD

DATA SOURCE(S) CODE: 1,2,4-7,12,15

ATTACHMENT H

RESPIRATOR INSPECTION PROCEDURES

RESPIRATOR INSPECTION PROCEDURES

Air-purifying respirators should be checked as follows before and after each use:

1. Examine the facepiece for:

   - o Excessive dirt;
   - o Cracks, tears, holes, or physical distortion of shape from improper storage;
   - o Inflexibility of rubber facepiece (stretch and knead to restore flexibility);
   - o Cracked or badly scratched lenses in full facepieces;
   - o Incorrectly mounted full facepiece lenses, or broken or missing mounting clips;
   - o Cracked or broken air-purifying element holder(s), badly worn threads, or missing gasket(s) if required.

2. Examine the head straps or head harness for:

   - o Breaks;
   - o Loss of elasticity;
   - o Broken or malfunctioning buckles and attachments;
   - o Excessively worn serrations on head harness, which might permit slippage (full facepieces only).

3. Examine the inhalation and exhalation valves for the following after removing its cover:

   - o Foreign material, such as detergent residue, dust particles, or human hair under the valve seat;
   - o Cracks, tears, or distortion in the valve material;
   - o Improper insertion of the valve body in the facepiece;
   - o Cracks, breaks, or chips in the valve body, particularly in the sealing surface;
   - o Missing or defective valve cover;
   - o Improper installation of the valve in the valve body;

4. Examine the air-purifying element for:

   - o Incorrect cartridge, canister, or filter for the hazard;
   - o Incorrect installation, loose connections, missing or worn gasket, or cross threading in the holder;
   - o Expired shelf-life date on the cartridge or canister;
   - o Cracks or dents in the outside case of the filter, cartridge or canister, indicated by the absence of sealing material, tape, foil, etc., over the inlet.

5. If the device has a corrugated breathing tube, examine it for:

- o Broken or missing end connectors;
- o Missing or loose hose clamps;
- o Deterioration, determined by stretching the tube and looking for cracks.

QUALITATIVE FIT TEST PROCEDURES

An employee shall be allowed to use only the specific make(s) and model(s) of air purifying respirators for which the person has obtained a satisfactory fit verified through fit testing procedures. An employee is not permitted to use any respirator not previously fit tested or if the results of the fit test indicated that the person was unable to obtain a satisfactory fit.

The following negative and positive pressure tests should be used each time a respirator is donned to check the face to face-seal fit.

- o Negative Pressure Sealing Checks For Tightly Fitting Air Purifying Respirators

  The wearer performs this test after donning an air purifying respirator. The test consists of closing off the inlets of the cartridge(s), canister or filters by covering them with the palm(s) of the hand(s) so that air cannot pass, inhaling gently, and holding one's breath for at least ten seconds. If a facepiece collapses slightly and no inward leakage of air into the facepiece is detected, it can be reasonably assumed that the fit of the respirator to the wearer is satisfactory.

  This is used only as a gross determination of fit when the respirator is to be worn in relatively toxic atmospheres. None the less, this test shall be used each time prior to entering a toxic atmosphere.

- o Positive Pressure Seal Check for Air Purifying Respirators with Inhalation and Exhalation Valves

  This test is very much like the negative pressure sealing check, above and is conducted by closing off the exhalation valve and exhaling gently. The fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece for at least 10 seconds without detecting any outward leakage of air between the sealing surface of the facepiece and the wearer's face.

  This test is also used only as a gross determination of fit when the respirator is to be worn in relatively toxic atmospheres. This test shall be used each time prior to entering a toxic atmosphere.

ATTACHMENT I

DAILY INSTRUMENT CALIBRATION CHECK SHEET

HEALTH & SAFETY PROGRAM
DAILY INSTRUMENT CALIBRATION CHECK SHEET

Project Name _____ Instrument _____

Job Number _____ Serial # _____

DATE	INSTRUMENT	BATTERY CHECK OK?	ZERO ADJUST OK?	CALIBRATION GAS (PPM)	READING (PPM)	CALIBRATED BY	COMMENTS